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ABSTRACT

This study examined learning transfer in adult acquisition of group process skills using a problem-based learning (PBL) approach to staff development in one school district. The study's theoretical framework included learning transfer, adult and organizational learning, and group work. Subjects, 29 instructional leaders and administrators, received two 3-day training periods each a year apart. Participants focused on a simulated cultural diversity PBL project in the first training session and a real PBL literacy project in the second training. The training format provided multiple opportunities to receive individual and group feedback on use of group processing skills. Each training session ended with participants developing an action plan for implementing new skills and knowledge in the next school year. Subjects were surveyed twice, a year after each training. Analysis of the surveys indicated that participants rated the training highly, believed they learned from the training, and transferred some of what they learned to their work situations. Qualitative analysis of open-ended survey questions indicated participants preferred the real to the simulated PBL project and expressed a need for more practice in group skills. Respondents reported that the main barrier to implementation was the lack of familiarity with the group processing approach by others. (Contains 41 references.) (JLS)

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ED 409 303

Running Head: Problem-Based Learning

A Problem-Based Learning Approach to Professional Development: Supporting Learning Transfer

A Paper Presented at the American Educational Research Association
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> There is not *one* kind of learning....Any learner has a host of learning strategies at command....We would do well to equip learners with a menu of their possibilities and, in the course of their education, to arm them with procedures and sensibilities that would make it possible for them to use the menu wisely.
>
> Jerome Bruner, 1985

In recent years there have been dramatic changes in the assumptions about effective professional development. These changes have included new visions of teaching and learning and the implications of these approaches for schools. Best practices in professional development are based on the assumption that professional development must be ongoing if it is to result in significant change. Another assumption is that the goal of staff development is to support inquiry into the study of teaching and learning. We now have evidence that professional development is essential to school development (Raywid, 1993; Cohen, 1993). We also know that educators learn because of training, practice, and feedback (double-loop learning) as well as through individual reflection and group inquiry into their practice. Finally, there is ample evidence showing that professional development should be school-focused and job embedded (Lieberman & McLaughlin, 1992; Little & McLaughlin, 1993; McLaughlin & Talbert, 1993).

This paper addresses the role of problem-based learning as an approach to the delivery of staff development in one school district. The paper begins with a theoretical framework based on research from the literature on learning transfer, adult and organizational learning and group work. This is followed by a description of the study and analysis of

both quantitative and qualitative findings. The paper concludes with a discussion of what role problem-based learning can play in staff training opportunities.

Theoretical Framework

Four areas of the research literature were particularly relevant to this study. They include research on: (1) learning transfer; 2) adult and organizational learning; (3) problem-based learning; and (4) group work.

Learning Transfer*

Baldwin and Ford (1989) define the transfer of training as the degree to which employees utilize knowledge, skills and behaviors learned during training to improve job performance. Researchers report that as little as 10% of what is taught in training programs actually transfers to the job (Baldwin & Ford, 1988; Broad & Newstrom, 1992). Clearly identifying approaches to training that can increase learning transfer to a greater degree will have a strong impact not only on in-service training, but also on pre-service training and preparation.

Laker (1990) differentiates between near and far transfer of learning which can be placed on a continuum. Near transfer is the extent to which an individual applies what was learned in training to similar situations in the workplace. The idea in near transfer is that the experience approximates as much as possible actual tasks individuals

* Different terms are used in the research literature. For example, when referring to school learning, the term 'transfer of learning' tends to be used. When researchers are discussing learning that transfers from a preparation or training program, or staff development opportunities the term 'transfer of training' tends to be used. Anthropologists refer to 'learning transmission' rather than learning transfer.

will be required to do on the job. Far transfer is the extent to which trainees apply the training to new or different situations from the ones experienced in training.

Training, like teaching, should be for transfer regardless of the setting. The research literature has identified a variety of factors that enhance transfer including: support, practice, relevancy, over learning, and feedback to name but a few (Broad & Newstrom, 1992; Lave & Wenger, 1993; Hastings, 1994).

Barriers to transfer include: lack of reinforcement, poor quality training, trainees perceptions that the training was irrelevant; interference from the work environment, a non-supportive organizational structure; discomfort or a sense of inadequacy in the level of training learned; and separation from the support of the trainer (Broad & Newstrom, 1992; Resnick, 1988; Lave & Wenger, 1993; Detterman & Sternberg, 1993).

Organizational and Adult Learning

Although Argyris and Schön (1978) are credited with writing the first serious treatment of the topic of organizational learning in their seminal book *Organizational Learning*, Cousins (1996) was the first educational researcher to provide a comprehensive review of the literature examining what organizational learning consists of. He examined how organizational learning differs from individual learning and what factors stimulate organizational learning and which organizational variables mediate influences on it. Cousins argues that organizational learning is not merely the sum of the learnings of each individual member. He found that "organizations that learn are extraordinarily open and forthcoming, thrive on experimentation and

risk, [and]tolerate ambiguity' (p. 646). He concluded that these organizations were able "to surface and eliminate hidden barriers to collective learning' p. 646). According to Tiler and Gibbons (1991) organizational learning can only take place through the actions and experiences of individuals. "What defines the organization as unique is the way in which it is able to marshal the learning experiences of individuals, to draw effectively upon this collective body of knowledge and experience in carrying out its business activities--and more importantly, that it is able to promote, invest in and coordinate further learning at the level of the individual and draw effectively upon this investment of the organization's resources" p. 48.

Since organizational learning rests on the actions and experiences of individuals, it is related to factors involved in adult learning. Adult learning is usually described as voluntary (Cross, 1992), self-directed (Knowles, 1980), practical (Dewey, 1916; Mezirow, 1991), participatory (Meyers & Jones, 1993), and related to self-concept (Knox, 1977; Merriam & Caffarella, 1991). Leithwood, Begley, & Cousins (1994), argue that adult learning theory supports instructional strategies that allow learners a significant role in shaping the nature and direction of their own instruction.

Adults often fail to apply the skills and knowledge they learn in one context (i.e., an in service session) to other situations. Yet, the transfer of skills and knowledge are basic expectations in any learning environment. Thus, the knowledge and skills acquired by adult educators during their professional development opportunities should help them think and understand more clearly about both teaching and learning.

Problem-Based Learning

Boud and Felleti (1991) state that "Problem-based learning is an approach to structuring the curriculum which involves confronting students with problems from practice which provide a stimulus for learning" (p. 21). According to Bridges (1992) problem-based learning has five characteristics: 1) The starting point for learning is a problem; 2) The problem is one the learner is apt to face as a professional; 3) The knowledge that learners are expected to acquire during their training is organized around problems rather than disciplines; 4) Learners, individually and collectively, assume a major responsibility for their own instruction and learning; and, 5) Most of the learning occurs within the context of small groups rather than lectures (p. 5-6)

Problem-based learning has considerable potential for affording students "actual instructional settings and tasks" (Leithwood, 1995, p. 130). This actuality is related to Perkins and Salomon's (1988) high road transfer. They contend that "High road transfer....depends on deliberate mindful abstraction of skill or knowledge from one context for application in another" (p. 25). In one type of high road transfer called *backward-reaching*, an individual reaches back into his/her experiences and tries to match the features of the current situation. Training programs cannot provide participants with opportunities to learn in all the many settings in which they will work (contextual knowledge) however, programs can provide opportunities in settings that will approximate the conditions which will be found in participant's job sites so that they can 'reach back.'

In one of the only analyses exploring how problem-based learning can be applied to professional development, Chenoweth and Everhart

(1995) found PBL to be particularly powerful for staff development. Some researchers such as Margetson (1991) argue that PBL encourages open-minded, reflective, critical and active learning. What is important to remember is that PBL is an approach to learning, rather than a strategy. Problem-based approaches view learning as a process of inquiry about what needs to be known to improve a particular situation.

Whether the problem is *real* or *simulated* (See Cordeiro & Campbell, 1996), problem-based learning requires students to *act on*, rather than simply talk about, the problem. Since the goal of training programs is that what is learned in the classroom is transferred to practice, the issue of learning transfer is central to this discussion. Problem-based learning affords students opportunities to act on problems, therefore one can speculate that a PBL approach may enhance the likelihood of both near and far transfer of learning.

Group Work

Since a major goal of PBL is to increase problem-solving expertise, Vygotsky's concept of the 'zone of proximal development' is a theoretical underpinning of PBL. This zone is the gap between what a person's individual capacity for problem-solving is and the capacity of the group or individual with whom the learner is working. In the group process of discussing and reflecting critically, the problem-solving capacities of the group afford the individual learner opportunities to internalize these group understandings.

The concepts of group problem solving and reflection are closely linked. PBL project groups use reflective skills to examine ill-structured problems by continually analyzing, exploring, gathering data, and critiquing. Describing the findings from a study on the problem-solving

of reputationally effective superintendents Leithwood (1995) describes the high level of reflection which he found to be an integral part of their problem solving practice. Similarly, Schön (1987) advocates for the need for "reflection-in-action through which practitioners sometimes make new sense of uncertain, unique or conflicted situations of practice" (p. 39). Schön argues that if instructors encourage reflection the student will not assume "that existing professional knowledge fits every case nor that every problem has a right answer" (p. 39). Reflective thinking is crucial to helping students improve their problem-solving expertise.

Purpose of the Study

One of the greatest challenges to school districts is to provide effective and efficient learning opportunities for staff development. Given the importance of this topic, and the constant need for all employees of an organization to have continuous learning opportunities, better understanding of how adults learn, what learning environments are more conducive to learning different types of knowledge (declarative, procedural and contextual) and what approaches will more effectively transmit that learning are paramount to the improvement of staff training.

This study involved two training periods of three days each. During the first training participants were taught skills in group processing that were then practiced during the session through a PBL project. Participants were provided with multiple opportunities to receive both individual and group feedback on their use of group processing skills. During the second training, more advanced group processing skills were presented. A problem-based learning project was once again used as a vehicle to practice these skills. Although this study presents

data regarding the learning transfer of group processing skills, it is the PBL approach that was used which is the focus of attention.

This study addressed the following questions.

In what ways did participants perceive that their skills in group processing improved with the training provided? In what ways did participants use the knowledge and skills learned during training in their workplace settings? What factors supported the transfer of learning in the training session to the workplace setting? What barriers prohibited the transfer of learning to the workplace setting?

and, What impact, if any, did PBL have on the training?

Methodology

This study was survey-correlational and qualitative in nature. A 29 item survey was used to collect data before and after each training. Additionally qualitative data were collected through five open-ended questions on the survey as well as through observation records kept by the trainers, and worksheets used by the participants in their group debriefings.

Sample

In June 1994 thirty-two instructional leaders and administrators from one New England school district participated in the three-day training session. Of the participants 56% (18) were female, and 44% (14) were male. The median age was 47, and the range was 30 to 59. All participants held advanced degrees with 47% (15) holding a Masters, 47% (15) holding a Sixth Year Diploma (Ed.S.) and 6% (2) have a doctorate. Participants were either administrators (41%) or instructional leaders (59%). The median length of time in the position was 8 years, however

there was considerable variation with the range was 4 months to 20 years.

Twenty-nine participants of the original 32 completed the training in June of 1995 when the second three-day training was scheduled. This study is examining the possibility of learning being transferred over time and the role of the two interventions, therefore only the results of the 29 participants who attended both training sessions and completed all instrumentation are included.

Training and Follow-up Sequence

Prior to the first three day training session a *simulated* PBL project dealing with issues of cultural diversity was created. This project included knowledge about working with diverse student populations and opportunities for skill development in group processing. Incorporated in both projects were opportunities to use group processing skills that were briefly presented at the beginning of each training period. In addition, each participant's packet of resources contained the following: information about the group processing method (The Interaction Method); short vignettes for dealing with typical problem behavior in groups; and several one-page handouts summarizing the research literature on effective group processing. The materials in the Year II packet built upon this information and provided more detailed information which some participants had requested after the first training.

Participants completed a survey containing a 19 item Likert scale requiring them to rate their skill level before and after the training. This survey also included five open ended questions requesting participants to comment as to how they planned to use the knowledge and skills learned

during the session. Additionally, participants were administered a one page pre-test and post-test containing 5 questions which examined their knowledge and understanding of the issues in the PBL project.

Prior to the second training phase (May 1995) a survey was mailed to all participants (96% response rate) asking them to identify factors which supported their development of the skills practiced in the first training session. Participants were also asked to describe any barriers that prevented or inhibited transfer.

The second training session (June 1995) provided more in-depth training in group processing and facilitation and presented a real problem currently confronting the district. Prior to training a *real* PBL project using a district problem dealing with issues of cultural diversity and literacy was created. At the beginning and conclusion of the second training session participants were once again asked to assess their skill levels. Additionally, participants completed a one page pre and post -test. This test included 5 knowledge based, open-ended items.

Each of the two, three-day training sessions ended with an action plan as to how during the course of the next school year, the skills and knowledge learned in the training could best be transferred to the workplace. Throughout both training sessions participants worked in groups in order to complete the assigned projects. A variety of written, audio and visual materials as well as technology access for completing the project task were afforded to participants.

During the PBL group sessions three trainers observed group and individual behavior and provided oral and written feedback at the end of each day. Also, participants debriefed group processes at the conclusion of each session. If participants desired, they could request individual

feedback from the trainers. Participants rated their PBL project groups as well as themselves in a variety of areas using a small group interaction survey created by the trainers and piloted prior to training. These ratings were tabulated, analyzed and reported back to each group prior to commencing the next session.

In May 1996 all participants were mailed the final follow-up survey which once again asked them to identify factors which supported their use of the skills practiced in the second training session as well as any barriers that prevented or inhibited transfer. Although the second training session included participants not included in the first training session, only data from the original 29 participants who were involved in both training sessions are included here.

Data Collection Procedures

Data collection began in June 1994 and ended in June 1996. Sources of data included: a demographic survey, a 19 item Likert scale survey with five open-ended questions, a knowledge pre and post test, individual and group self-ratings, observation records of individual and small group interactions, and field notes written by the trainers each day following training.

Instrumentation

The survey is a 24-item self-report questionnaire. Nineteen items were written on a 5-point Likert scale and five questions were open-ended. Nine additional questions elicited demographic data. The survey was administered to the participants at the beginning and end of each 3-day training session. Additionally, one year following the second training it was administered for the final time. This survey was designed to measure participants ' self-perceptions of group processing skills

before and after the Instructional Leader Training Workshops. This self-report instrument measured the growth over time of learned skills. The survey measures the following dimensions of group processing skills: communication, problem-solving, group facilitation, group behavior, and collaboration. This instrument was based on research on group processing and group learning by Corey and Corey, 1992; Doyle and Straus, 1982; Webb, 1989; Schoenfeld, 1989; and, Cohen, 1994. The survey was piloted with a group of twelve educators and several changes were the made to the instrument prior to being used.

A second instrument created by the authors was entitled "Rating Group Effectiveness". This instrument was used by participants at the end of each session to rate their small group's behavior in ten areas on a seven-point Likert scale. Items included listening, diagnosing of problems, leadership, trust, and conflict, among others. These data were analyzed by the trainers during the sessions and were provided to participants as feedback before the start of the next session.

Access and Confidentiality

Upon obtaining assurance that confidentiality would be maintained, permission was granted by the district to conduct the study. This study was not requested by the district, nor was it a part of the overall focus of the training. Participants were asked to list the last four digits of their social security numbers on all instrumentation. Reports of the results were shared with district personnel; however, anonymity of all participants was maintained.

Limitations

Because this study involved only one school district its findings are not generalizable to a sample that differs considerably from the

sample described here. This study did not include a control group, therefore comparisons should not be made. A self-report questionnaire was used in this study, and therefore the actual level of skill, rather than the perceived level of skill before and after the training, is unknown.

Data Analysis

The statistical package SPSS was used for analyzing quantitative data. This included frequency data, rank-ordered data, and interval data (Likert scale) items. These data permitted descriptive analyses, correlational analyses, and one-way analysis of variance. An observation instrument created by the authors and piloted prior to training was used at each of the two training sessions to gather observational data for analyzing group processing skills. Data from the open-ended survey questions and trainers' field notes were coded for themes.

Although no control group existed for this study, several statistical analyses were conducted as a follow-up to the qualitative analysis of the training. A description of the quantitative analyses includes a Repeated Measure ANOVA (RM ANOVA), post hoc tests, and related t-tests on the individual survey items.

Coding for the qualitative data involved a two-step process: initial and focus coding. In the initial phase we examined what we could define and discover in the data. Focused coding was the selective and conceptual phase of the process (Glaser, 1978; Charmaz, 1983)

Analysis of the Questionnaire

A Repeated Measure ANOVA (RM ANOVA) indicated there was a significant statistical difference in participants' perceptions of their group processing skills over time ($F_{56, 2=7}$; $p < .05$; ES=.66). (The pre-

test was used as a covariant.) A post hoc analysis (i.e., a series of related t-tests) indicated that perceptions of group processing skills improved in the first year from before the training to after the training ($t=10.53$, $p<.001$, ES=>.80). The group processing skills were maintained from the time period after the first training session to the beginning of the second training a year later ($t=5.38$; $p< .001$, ES=>.80). The statistical analysis suggests that the participants perceived their group processing skills had improved during this time.

During the second year, there was no difference in participants' self-perceptions of their group processing skills from before and after the training workshop. The survey was sent to all participants a year later to measure the maintenance of their group processing skills over time. A related t-test indicated that participants' perceptions improved from the end of their second training session to a year later ($t=7.12$; $p<.001$, ES=>.80).

Additional related-tests were used to measure changes in participants perceptions of individual group processing skills (e.g., communication, collaboration, etc.). The level of significance was .05. A pairwise comparison test was used to control for a Type I error rate. Effect sizes (ES) were calculated for those items with statistical mean score differences.

Year One Analysis (Pre-Post)

In the first year participants perceptions of their group processing skills improved from before the training to after the training in the following areas:

Item	Group Processing Skill	t value	Effect Size
1	ability to facilitate group	4.48	>.80
3	ability to help group reach goal	3.41	.64
4	ability to express facts/relevant information to group	3.20	.61
5	ability to creatively solve a problem within a group context	3.28	.61
6	ability to recognize dysfunctional group behavior	3.79	.72
7	effectively deal with dysfunctional group behavior	6.01	>.80
11	ability to clarify, synthesize & summarize group ideas	5.20	>.80
12	ability to recognize 'ingredients' of successful meeting	6.27	>.80
13	provide constructive feedback to peers about group behavior	4.80	>.80
14	ability to reflect on my group behavior to change it	7.64	>.80
15	knowledge of effective group processing skills	8.32	>.80
16	knowledge of effective group roles and behaviors	10.49	>.80

While not all item mean score differences were statistically significant, in general participants' perceptions of group processing skills improved from before the training to after the training. Although the

sample size is small (n=29), the effect sizes are medium to large indicating the mean differences have practical significance.

Year Two Analysis (pre-post)

An analysis of the pre and post survey data from the second year indicated there were no significant differences in participants' perceptions of their group processing skills.

Analysis of Year Two Post Data to Year Three Data

To measure the maintenance of group processing skills from the end of the second workshop to a year later, the year two survey post scores were compared to the year three survey data. The findings suggest that the participants' perceptions of their group processing skills improved over this time with no additional training in the following areas:

Item	Group Processing Skill	t value	Effect Size
10	ability to communicate my ideas clearly to the group	3.84	.75
11	ability to clarify, synthesize & summarize group ideas	3.55	.67
12	ability to recognize 'ingredients' of successful meeting	3.55	.66
13	provide constructive feedback to peers about group. behavior	3.52	.66
16	knowledge of effective group roles and behaviors	4.48	>.80

Qualitative Data

Both topics (cultural diversity and literacy) for the training and the approach used (PBL) were chosen by participants. Participants rated the training either *highly favorable* (76% n=22), *favorable* (17% n=5), or *fair* (7% n=2) on a five point scale. One question on the posttest asked participants to describe how, if at all, they planned to use the group processing skills taught in the training. Although all participants described ways they planned to use the skills, in reality during the first year after training only five (17%) of the participants reported using the group processing skills presented and practiced during this initial training. Most participants (82%) reported they had not had sufficient practice in using the skills. One administrator commented, "I didn't realize how complex it is to organize and work in teams. At first I rated myself real high in lots of areas, then after the project, I realized I didn't have any skill in a particular area." This is particularly interesting given that the quantitative data show that participants' perceptions of their group processing skills improved from before the training to after the training. Thus, although participants found the training to be either favorable or highly favorable (89%), and although they perceived their skills in group processing to have improved significantly, the majority of participants did not use the skills learned in training on the job during that first year.

The quantitative data show that participants did not perceive they had significantly improved their skills in group processing after the second training. Yet, for the second training the level of satisfaction with the training improved even more: 90% (n=26) of the participants rated the training highly favorable, 7% (n=2) rated it favorable and 3%

(n=1) rated it fair. Thus, 97% of the participants rated the training either favorable or highly favorable. An instructional leader commented, "There's so much to do to be good at group processing. I overrated myself last year....I didn't have as much skill as I thought I did."

During the year following the second training (1995-1996) all participants (N=29; 100%) reported using group processing skills learned during the training. Participants described a wide array of situations in which skills were used including: staff meetings, Literacy Council meetings, committee meetings, pupil study team meetings, faculty meetings, Principal's Advisory Council meetings, team meetings, department meetings, School Improvement Team meetings, Board of Education sessions, and project committees.

Participants were asked to describe how, in these sessions, they actually used the skills they had learned in the first and second training. Responses were categorized into the following areas: moderating/facilitating/chairing/managing/planning and /or organizing meetings; recording information for the group; arbitrating/mediating; helping to establish common goals/reaching consensus; understanding behaviors/recognizing dysfunctional behavior; and providing feedback to others about their behavior in the group. One high school instructional leader wrote, "This training has given me so much more confidence....Putting people in PBL type situations was so real. At department meetings I think about when I was the facilitator in my group and I've been able to play different roles--manager, recorder, facilitator. With students and fellow teachers I am forcing myself to slow down, review ideas and concepts...I now know how important it is to try to work on clarification and reinforcement in order to communicate

ideas, facilitate group relationships and arbitrate combative conversations."

A principal commented, "I've always thought I had to chair the meetings, but I don't. The skills we learned and practiced in the training were so important....I consciously try to work on these skills every day."

An instructional leader noted, "I facilitated a committee of people with very diverse opinions concerning a very controversial topic and felt successful. I studied group processing skills before each meeting! The project we did was truly a case of learning by doing. The feedback that we received from each other and you [the trainer] was vital. I had never received any feedback as to what I should or shouldn't do in a group before. I used to know that some behaviors were not helping us get anywhere, but I didn't know why. I had never talked about it before."

A high school instructional leader commented, "The training was threatening. We looked at each other under a microscope. The good part was I realized that although we are a diverse bunch in this district, most of the people want the best for kids. My group made me proud and I now feel I know people better and why they believe the things they do. The project really simulated a team I'm on."

A middle school instructional leader commented, "I had never before learned how to deal with difficult people. Because of the projects we worked on I was able to bring a group to consensus in terms of group dynamics and dealing with one group member who is always negative and often angry and annoyed by change or disruption to his schedule. If feel really good about this. If we have more training I'd like to get even more into dealing with hostile behavior."

A high school instructional leader commented, "Usually we have staff development that teaches you how to do something by talking about it. But in this training I learned by doing. Each day when we got back into our small groups and got those sheets back with how we had rated our group and overall comments, we started working even harder to show that we could be a productive group....This past year we joked about the training and those feedback sheets, they were hell, but they really helped me. I think they helped everybody, even those people who were real resistant."

Barriers to Transfer Identified After Year I and Year II

When participants were asked to name any barriers as to why they did not use what they had learned in training, ten respondents identified *lack of familiarity* with the group processing approach *by others* as the main barrier. The remainder of the respondents stated that there were no barriers. There was a frustration noted by several respondents. One elementary instructional leader stated that "...others are not familiar with the skills/roles so it makes it difficult to try to use them." These respondents felt that all teachers in the district should receive training in group processing. One administrator commented, "It's not enough that I have these skills. I can't teach them to everybody else....Teachers should have the same training that we had. They need to have the same kind of opportunities to practice in groups with a problem as we had and they need to have the same kind of conversations and feedback."

Problem-Based Learning as an Avenue to Teach Group Processing Skills

At the conclusion of each training session, participants were asked the following question: This training involved a *simulated* PBL Project (Unity in Diversity: Changes in Seaview-- in Year I) (or, a *real* PBL project --Centerville's Literacy Initiatives-- in Year II training). Please comment on the PBL Project and your use of group processing skills while working on it. After analyzing the responses to this question, two areas differed from Year I to Year II. One theme after the Year I training noted that participants would have preferred a *'real' problem* as a basis for the project. One instructional leader commented, "I learned a lot about cultural diversity from the readings, my small group and the final presentations, but I would have preferred to be dealing with a real problem that the district actually has. Maybe this will help in the future, but I'd rather work on our current needs."

The second theme that emerged from the data was the need for participants to have lots of *practice*. Several Year I quotes capture the essence of this need. An assistant Principal commented, " I learned a lot about working with people in groups. I hope to use this in the next school year, but I' m still not comfortable in dealing with conflict and giving my peers feedback about how they interact in a group." An instructional leader stated, "I can't believe I'm saying this, but I want to do one more project--maybe in a few months--so that I can practice these skills again. I need to really feel comfortable, safe...before I can use some of them."

From the Year II responses the theme of *practice* appeared, however it had a different focus. A principal stated, "I'm a lot more comfortable

with this method than I was after last year. I just needed to practice it in a somewhat safe environment....By safe I mean that we are all working on the same skills together." Other respondents noted that their "comfort level is a lot higher" than it had been the year before because of the additional opportunity to "intensely practice these skills." Thus, participants believe that because they had a second opportunity to practice group processing skills their efficacy level was considerably higher than it had been after Year I.

Finally all participants reported that Problem-based learning was an effective approach for staff development. One principal stated, "Not only did I learn what problem-based learning is about, but I also feel I can use it myself as an approach for staff development." An Assistant Principal noted, "Problem-based learning is one of the best ways for a person to learn...it's simulates the real job and forces people to interact....People got frustrated with each other just like they do at meetings....That's why the group processing skills were so important. If we hadn't been forced into using a group processing method the project would have been no more or less effective than projects we work on in our teams....Now I know our team meetings will be better." Another administrator commented, "PBL provides an incredible opportunity to learn and then practice what you're learning...and because you get feedback, you can change your behavior." Another explained, "I enjoyed learning from my group members....and if we didn't know the answer, we went to someone we thought could help us." A middle school instructional leader noted, "I set my own learning goals in this training. And then I worked hard to achieve them. I was able to monitor myself through the feedback I received....If I didn't have that feedback I couldn't

have self-evaluated....I wouldn't have recognized that I do some of the things I do." Finally, an instructional leader commented, "How absolutely necessary it is to be reflective of one's behavior. The project encouraged us to reflect."

Thus, participants reported that PBL provides opportunities similar to *on-the-job learning*, allowed people to *practice* and *reflect* on their learnings, afforded participants opportunities to *learn from others*, and included *peer* and *self evaluation*.

Discussion

So what do these data tell us about problem-based learning as an approach to professional development? As we examine the literature on how adults learn and the literature on best practices in professional development, it is evident the problem-based learning includes many of these elements. Clearly the data presented here show that participants: 1) were favorable about the quality of the training; 2) believed they had learned from the training; 3) transferred some of what they had learned from the training, and 4) believed that PBL was a valuable approach to use to learn the content of the training.

In a seminal book on transfer, Detterman and Sternberg (1993) state, "The lesson learned from studies of transfer is that, if you want people to learn something, teach it to them. Don't teach them something else and expect them to figure out what you really want them to do" (p. 21). In other words if we want people to learn about group interaction and cultural diversity, then they need to be directly exposed to group processing skills and have multiple opportunities to apply the knowledge they are learning. The authors add that knowledge of basic cognitive "processes will help in formulating educational interventions"

p. 22. These basic cognitive processes include concepts such as Perkins and Salomon's *backward reaching high road transfer* mentioned earlier.

Figure 1 is a proposed model of how PBL, complimented by the teaching of cognitive strategies, may be more effective that PBL used alone. In the model, PBL is set within three assumptions: the quality of the training is rated highly by the participants, participants choose the topic for training, and participants set their own learning goals.
One way that staff development might differ from pre-service training is that we can assume that general learnings about the profession occurred in the preparation program and that staff development is more of a refinement of skills and knowledge (e.g., more depth in a content are of teaching). The question arises as to who is the best person to choose the topic areas and learning goals. Certainly, the experienced professional has a better grasp of what s/he needs to learn, while often the student in a preparation program is unaware that s/he needs to learn something. Thus, the learner choosing and setting his/her learning goals is an important feature of any training.

The seven characteristics in the second box attributed to *real* and *simulated* PBL are closely tied to what the research literature on adult learning, organizational learning, and group learning have to say about important elements of learning. It should be noted that participants preferred the *real* PBL project over the *simulated* project because of its immediate relevancy to the workplace. Thus, although both approaches were rated favorably by participants, several noted their preference for real problems. Finally, we are proposing that if in conjunction with the training, the instructor/trainer includes mechanisms for transfer, then PBL may hold even greater potential for all types of learning transfer.

As stated earlier this study was limited in several ways, nonetheless participants believed that their skills improved. They attributed this to certain aspects of PBL, in particular, interaction, feedback, and practice. PBL accompanied by various types of cognitive strategies such as those listed in the model might prove beneficial to learners by significantly increasing transfer.

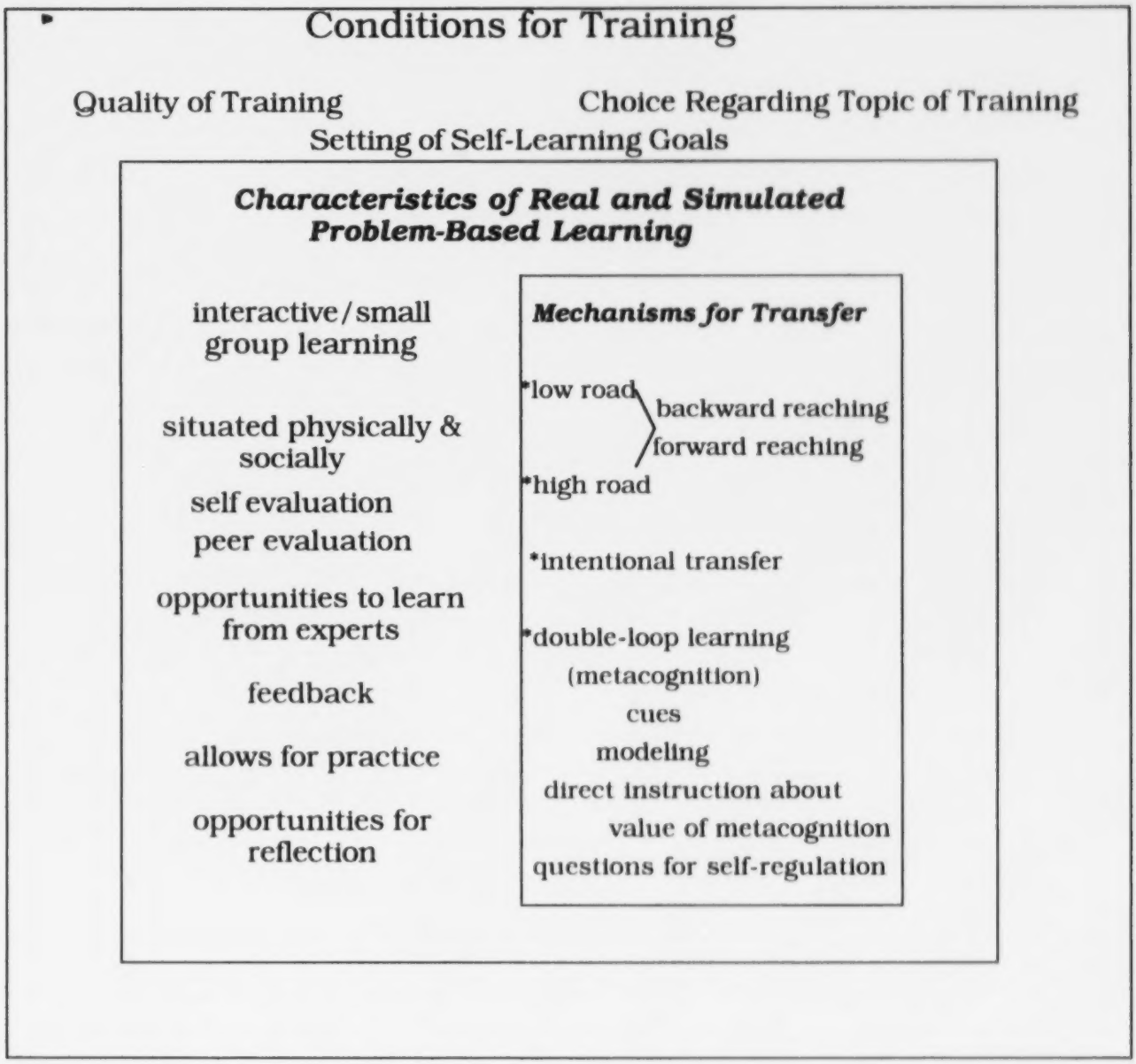

Figure 1 Conditions for Training

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